Association Between Ozone Exposure and Death:

Results from Three Recently Published Meta-Analyses

November 17, 2005

Air Resources Board

California Environmental Protection Agency

Ozone Exposure and Public Health

- New 8-hour Ozone Standard (0.070 ppm)
- Health effects of ozone exposure
  - ➢ Reduced lung function
  - ➢ Airway inflammation
  - ➢ Respiratory symptoms (e.g. cough, chest tightness)
  - ➢ Increased hospital and ER visits
  - ➢ Increased school absenteeism
  - ➢ Possible asthma induction in active children
  - ➢ Premature death

Overview of Three Studies

- Levy et al.[1] - 28 studies from 40 cities in U.S., Canada, and Europe

- Bell et al.[2] – 32 studies from 41 cities in U.S. and Europe

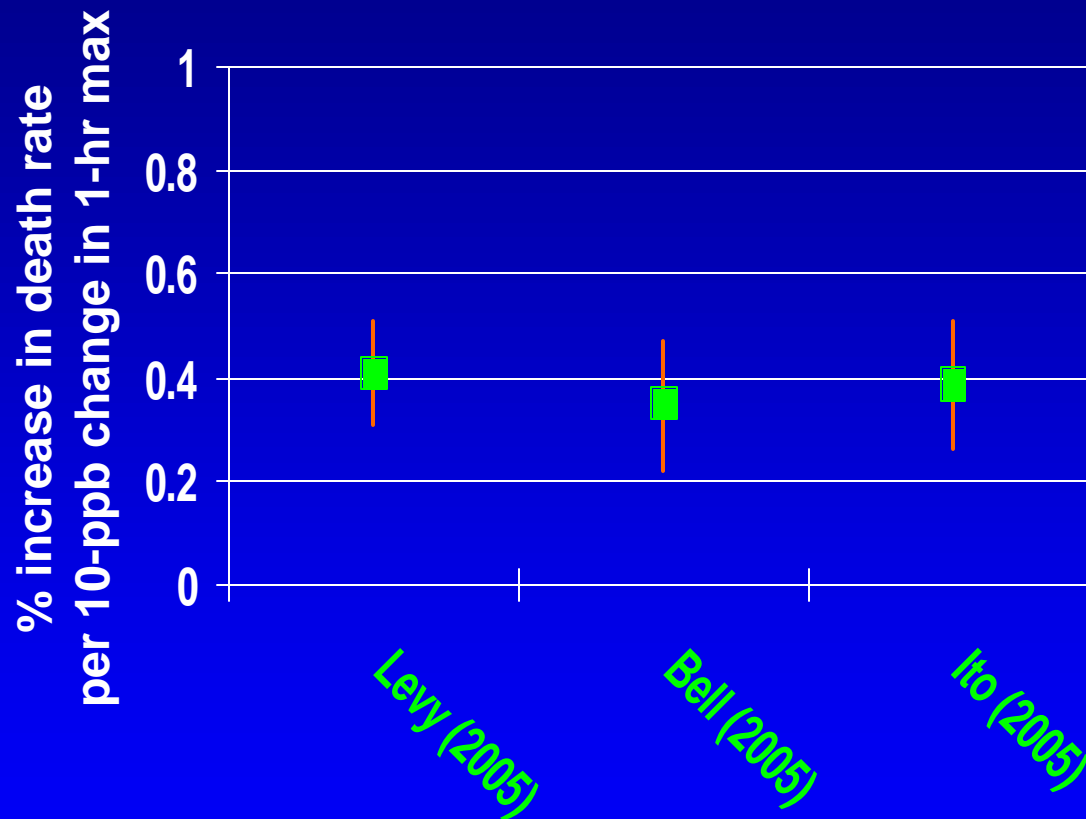- Ito et al.[3] - 43 studies from 7 U.S. cities and 32 cities in other parts of the world

[1]Levy et al. (2005) Epidemiology, Volume 16, Number 14, pages 458-468

[2]Bell et al. (2005) Epidemiology, Volume 16, Number 14, pages 436-445

[3]Ito et al. (2005) Epidemiology, Volume 16, Number 14, pages 446-457
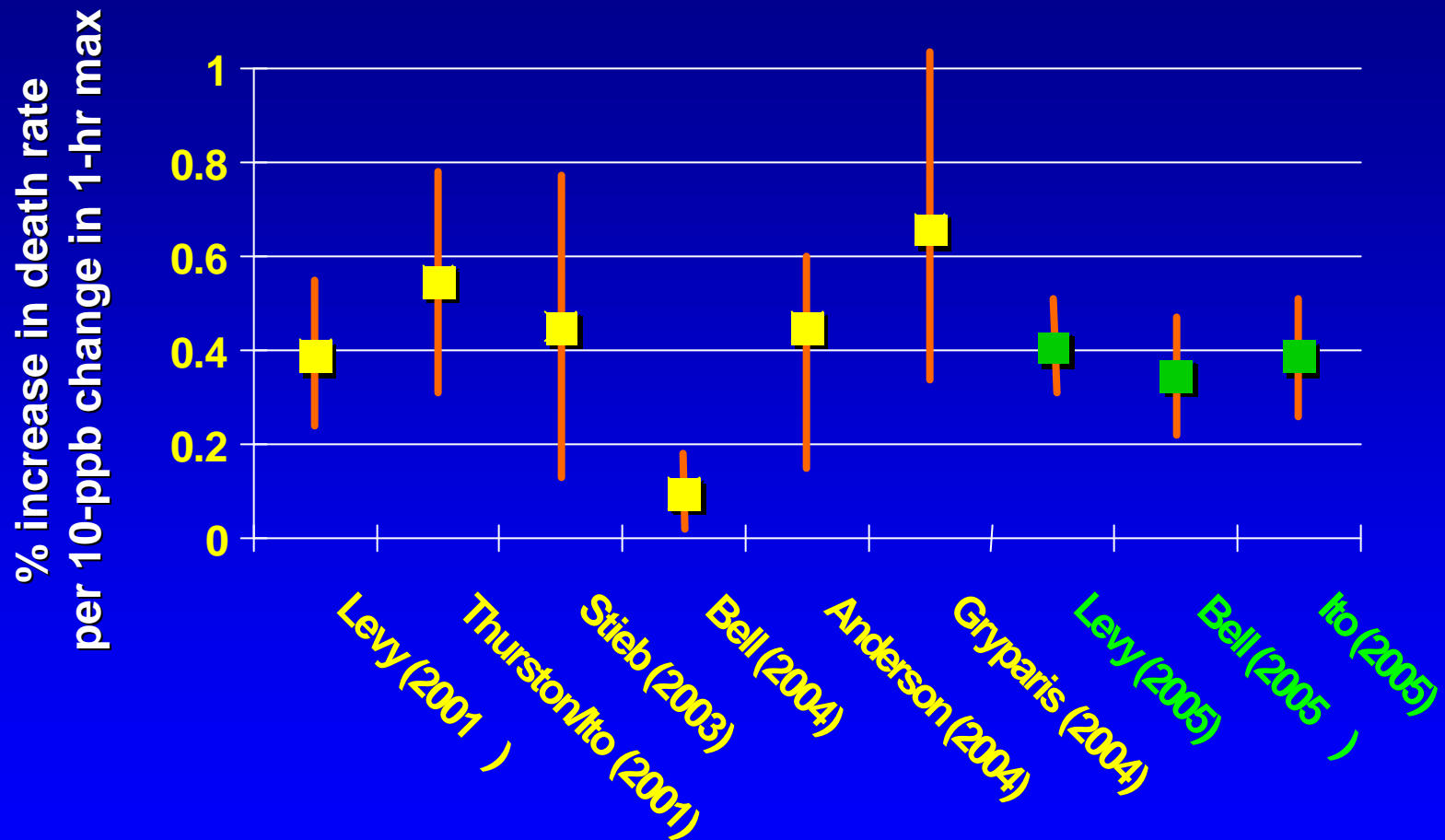
Summary Findings of Three Studies

A 10 ppb increase in 1-hr ozone associated with ~0.4% increase in death

Effect of Ozone Exposure on Death Results of Studies (2001-2005)

Health Benefits of Reducing Ozone in California

- An estimated 630 deaths (probable range: 310 to 950) avoided annually if the 8-hour standard of 0.070 ppm is attained

  - ➢ 3 new studies consistent with the other meta-analyses and these results

- Methodology peer-reviewed by experts in the field and is similar to U.S. EPA's

Ozone Effects on Health: Summary

- Ozone effects on death supported by analyses

  ➢ Additional evidence of health benefits from reduced ozone pollution

- Studies support conclusions for ozone standard approved by Board in April 2005

- Future research addresses biological mechanisms of ozone effects on premature death